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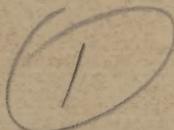
A STATEMENT

OF THE

CASE OF THE PEOPLE

AGAINST

ELISHA B. FERO.



BY

CHARLES H. PORTER, M. D.

ALBANY, N. Y.

[FROM THE JOURNAL OF PSYCHOLOGICAL MEDICINE, APRIL, 1870.]

NEW YORK:
D. APPLETON & COMPANY,
90, 92 & 94 GRAND STREET.
1870.

Elliot's Obstetric Clinic.

A Practical Contribution to the Study of Obstetrics and the Diseases of Women and Children. By GEORGE T. ELLIOT, Jr., A. M., M. D., Prof. of Obstetrics and the Diseases of Women and Children in the Bellevue Hospital Medical College, Physician to Bellevue Hospital and to the New York Lying-in Hospital, etc., etc. 8vo, pp. 458. Cloth, \$4.50

This volume, by Dr. Elliot, is based upon a large experience, including fourteen years of service in the lying-in department of Bellevue Hospital of this city. The book has attracted marked attention, and has elicited from the medical press, both of this country and Europe, the most flattering commendations. It is justly believed that the work is one of the most valuable contributions to obstetric literature that has appeared for many years, and, being eminently practical in its character, cannot fail to be of great service to obstetricians.

"The volume by Dr. Elliot has scarcely less value, although in a different direction, than that of the Edinburgh physician (Dr. Duncan, *Researches in Obstetrics*). The materials comprising it have been principally gathered through a service of fourteen years in the Bellevue Hospital, New York, during the whole of which time the author has been engaged in clinical teaching. The cases now collected into a handsome volume illustrate faithfully the anxieties and disappointments, as well as the fatigues and successes, which are inseparable from the responsible practice of obstetrics—a line of practice which, under difficulties, demands the greatest moral courage, the highest skill, and the power of acting promptly on a sudden emergency. Dr. Elliot's favorite subject appears to be operative midwifery; but the chapters on the relations of albuminuria to pregnancy, ante-partum haemorrhage, the induction of labor, and the dangers which arise from compression of the funis, are all deserving of careful perusal. The pleasure we feel at being able to speak so favorably of Dr. Elliot's volume is enhanced by the circumstance that he was a pupil at the Dublin Lying-in Hospital when Dr. Shekelton was master. We can certainly say that his teachings reflect great credit upon his Alma Mater."—*London Lancet*, April 11, 1868.

"This may be said to belong to a class of books 'after the practitioner's own heart.' In them he finds a wider range of cases than comes under his observation in ordinary practice; in them he learns the application of the most recent improvements of his art; in them he finds the counterpart of cases which have caused him the deepest anxiety; in them, too, he may find consolation, for the regret—the offspring of limited experience, which has always cast a shadow on the remembrance of some of his fatal cases—will pass away as he reads of similar ones in which far greater resources of every kind failed to avert a fatal termination.

"There are not many books of this kind in our language; they can probably all be numbered on the fingers of a single hand. * * * Many circumstances concur, therefore, to influence us to extend to this work a cheerful welcome, and to commend it as fully as possible. We do thus welcome it: as the production of a gentleman of great experience, acknowledged ability, and high position—as an emanation from one of the leading schools of our country, and as an honorable addition to our national medical literature."—*American Journal of Medical Science*, April, 1868.

"As the book now stands, it is invaluable for the practitioner of obstetrics, for he will hardly ever in practice find himself in a tight place, the counterpart of which he will not find in Dr. Elliot's book."—*New York Medical Journal*, February, 1868.

"The book has the freshness of hospital practice throughout, in reference to diagnosis, pathology, therapeutical and operative proceedings. It will be found to possess a great amount of valuable information in the department of obstetrics, in an attractive and easy style, according to the most modern and improved views of the profession."—*Cincinnati Lancet and Observer*, April, 1868.

"As a whole, we know of no similar work which has issued from the American press, which can be compared with it. It ought to be in the hands of every practitioner of midwifery in the country."—*Boston Medical and Surgical Journal*.

"One of the most attractive as well as forcibly instructive works we have had the pleasure of reading. In conclusion, we recommend it as one having no equal in the English language, as regards clinical instruction in obstetrics."—*Am. Jour. of Obstetrics*, Aug., 1868.

Many ripe, elderly practitioners might, but few young could, write a book so distinguished by candor, want of prejudice, kindly feeling, soundness of judgment, and extent of erudition. While we do not say the book is faultless, we say there is no book in American obstetrical literature that surpasses this one. * * * * The work now under review is his first-born book or volume, and shows how fine opportunities he has had, chiefly at Bellevue Hospital, for acquiring experience, and how diligently he has availed himself of them. But his book shows much more. It is the work of a physician of high education, a qualification in which obstetric authors are often deficient—it shows qualities of mind and skill of hand rarely attained by so young a man."—*Edinburgh Medical Journal*, Feb., 1868.

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*Brent by
A. E. M. Purdy*

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CASE OF THE PEOPLE

AGAINST

ELISHA B. FERO.

Principal Subjects discussed : Essential Characters of Contusion, Infiltration, Suggillation, and other Discolorations of the Cadaver ; Methods of distinguishing between them ; Extensive Fractures of the Skull by small Balls ; Contre-coup Fractures of the Skull by small Balls ; Fractures of the Skull produced by Unskilfulness in removing the Skull-cap.

THE case of The People *vs.* Elisha B. Fero was tried at the Delaware (N. Y.) Oyer and Terminer, commencing September 23, and ending October 1, 1869, Hon. Ransom Balcom presiding. Hon. M. B. Champlain, Attorney-General ; H. F. Davidson, District Attorney ; F. R. Gilbert and N. P. Hinman appeared for the people ; Henry Smith, N. C. Moak, Charles Holmes, W. Gleason, and A. R. Gibbs, for the prisoner.

Fero was indicted for the murder of his wife, Louisa Fero, on the morning of November 24, 1868, by shooting her in the head with a pistol, and by striking her upon the head with unknown weapons.

The following facts were not disputed : The accused was a merchant, living in the village of West Davenport, and doing business at that place. His house, which fronted to the north, was near (thirty feet distant from) his store, and in the immediate vicinity of other dwellings. The room in which he slept with his wife was on the east side of the house ;

its dimensions were eight by twelve feet. The bed was in the northeast corner; between it and the south wall were a bureau and a chair, thus leaving in front of the bed but a passage three feet wide.

On the east side, near the head of the bed, was a window, the only one in the apartment. The door was opposite the window, and opened directly into the kitchen. The entrance to the kitchen from without the house was by a door on the west side.

At about two o'clock, on the morning of November 24th, the neighbors living near the house heard the sound of a pistol-shot, and, in a few minutes after, several other shots and calls for help. Upon going to the house, in which there was no light, Fero was found near the kitchen door, down upon one knee, with his hands at his sides. He was crying, appeared greatly excited, and trembled, and said: "Oh, dear, some one has been here!" He had on his coat, trousers, and vest, his suspenders were hanging down behind, stockings were upon his feet, but no boots or shoes, neither had he on collar nor cravat. As he seemed much exhausted and could not well stand, he was assisted to a lounge, and supported while sitting there, by a man on either side. He took a small Smith and Wesson's revolving pistol from his coat-pocket and handed it to a neighbor, who placed it in a desk. He recounted the occurrences of the night (which will be stated hereafter), and said that he did not see why Louisa (his wife) did not get up. Upon going to the bedroom with a lantern, a gurgling sound was heard from Mrs. Fero; a moment after, she died. She was lying in the back of the bed, with her face toward the wall. A small hole, apparently made by a pistol-ball, was observed above the left ear. The only blood visible was that which

had quietly flowed from the ball-hole, in a fan-like form, across the left side of her face, disappearing beneath her person.

In the excitement of the moment, and having but a single lantern with them, it is not probable that the parties who entered the bedroom made a deliberate and accurate survey of other objects than the body; the circumstances will account for slight discrepancies which occur in their statements. It appears, however, that the bed-clothing, which partially covered the shoulders, was somewhat rumpled, and a little lower down in front of the bed than behind, and that the front pillow was flattened. The furniture of the bedroom and kitchen was undisturbed. A few spots of blood were found on a desk which was in the kitchen, on the casing of the outer door, and on the door-step of the same apartment.

The fact that his wife was dead was immediately told to Fero, who received the announcement with emotion. He wept, and was in apparent agony; making use of the following and similar expressions: "Oh, is Louisa dead?" "My all is gone!" "Oh, dear! it would have been better if it had been me instead of her." He started to go to the bedroom, but was taken back by those who were assisting him.

Fero's statement was substantially as follows: Three or four months previous to the murder, hearing a noise about midnight, he got up, and went to the kitchen window, when he caught a glimpse of a man. He mentioned this circumstance to a neighbor (as was proved). A few nights afterward, he heard a similar noise, but saw no one. Mrs. Fero was usually in good health; a day or two before her death, however, she had a pain in her stomach, and was told by

her physician to apply to the part flannel cloths wet with hot water. This was done on the night of the murder after they went to bed, a little after eleven o'clock. His pocket-book, containing \$250, he placed under his pillow between himself and wife. Upon examining the bed after the discovery of the murder, no pocket-book was found. They both lay upon their right sides, that is, with their faces toward the back of the bed. At about two o'clock, he felt something touch his shoulders or draw the bed-clothes down. He raised his right hand, which came in contact with the barrel of a pistol, and seizing it, jerked it down, when it was discharged. He grasped the robber's arm with his left hand, and, maintaining his hold, was drawn out of bed. As he touched the floor, he received a blow over the left eye, and called to his wife to get up and light a lamp. The struggle was continued, first in the bedroom, and then in the kitchen, where he received a number of blows, and finally a kick on the scrotum, which compelled him to loose his hold. The robber then escaped through the kitchen door. Going to the desk (where the spots of blood before spoken of were found), he obtained his pistol, and, opening the door, fired it and hallooed. Having nothing but his shirt on, he returned to the bedroom for his clothing, leaving the pistol upon the desk. His wife did not at any time answer his calls. Not finding his trousers upon the chair near the head of the bed, their usual place, he put on his vest, coat, and stockings, and finally discovered his trousers on the kitchen floor, by his feet coming in contact with them. He put them on.

He again fired his pistol from the kitchen door, and heard the voice of a neighbor saying that he would be over as soon as he obtained a light. Fero then sank

upon the floor from exhaustion and fright, where he remained until the neighbors came in, when he attempted to rise, and was assisted by them in doing so.

It has already been stated that Fero was found crying, agitated, and excited. There was a bruise on his left eye-brow, but the skin was not broken, his nose was scratched, and his lips swollen. Blood was running from the scratch upon his nose, and from the nostrils over his lips. There were black marks, as if from burnt powder, between the middle fingers of his right hand. No other marks of injury were found upon his person.

Preparatory to the *post-mortem* dissection, the position of the body and its external appearance were observed. Mrs. Fero lay in the back part of the bed upon her abdomen, her head resting upon the right side. Both arms were extended and beneath her; the hands were near each other. A ball-hole was found above her left ear. The blood from the wound had flowed over the left side of the face upon her neck, and formed a large pool beneath her chest. A wet flannel folded a number of times covered her stomach and lay smoothly upon it. There was a slight swelling around the ball-hole, but no other swelling, no black and blue spots, abrasions, or other evidence of external violence, were found. The dissection (made by Dr. M. Case) was commenced at ten o'clock, eight hours after her death. An incision was made across the top of the head, extending from ear to ear, the blood was found to be liquid. Before noticing the condition of the tissues covering the skull, the fractures will be described as they were subsequently found. The ball entered the skull two inches above the external orifice of the left ear, making an aperture of irregular form (whose

average diameter was five-sixteenths of an inch), having small radiating fractures. (See Fig. 1.) This aperture communicated below, by a fracture a quarter of an inch in length, with an opening made by the removal of a triangular piece of bone which had been separated by fractures on either side. This triangular opening was in the course of a fracture which extended posteriorly to within an inch of the occipital protuberance. The fracture extended anteriorly across the temporal, sphenoid, and in the frontal bone above the left superciliary ridge, then inclining to the right, upward and backward, terminated in the right parietal bone, just posterior to the coronal suture. The length of this fracture was eleven and a half inches.

FIG. 1.

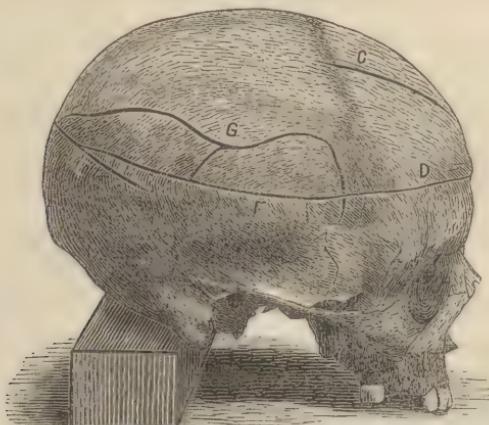


Fac-simile of Mrs. Fero's skull. Left side. A. Ball-hole and radiating fractures. B. Triangular opening. C. Great fracture on left side. D. First saw-cut. E. Second saw-cut.

A fracture on the right side was found, commencing near the junction of the sagittal and lambdoidal sutures, passing over the parietal eminence, then into the transverse suture, and terminated in the middle of the right supraorbital plate. (See Fig. 2.) The length

of this fracture was ten and a half inches. A fracture an inch in length was found in the right parietal bone, which terminated at its upper extremity in the main fracture.

FIG. 2.



Fac-simile of Mrs. Fero's skull. Right side. C. Continuation of great fracture on left side. D. First saw-cut. E. Second saw-cut. F. Third saw-cut. G. Great fracture on right side. (See Fig. 1.)

The doctor (Case) says that, before removing the skull-cap, he observed, perhaps, two or three inches of a fracture in the immediate neighborhood of the bullet-wound, and on the right side perhaps the same length of another fracture, the central portion of it. Thus, after simply laying back the scalp, without removing muscle, connective tissue, or pericranium, it is stated that fractures to the above extent were discovered, no part of which were depressed! Dr. C. says the areolar tissue, and, as is inferred, the corresponding parts of the scalp, to some extent, appeared to be "injected" with blood over the posterior portion of the right side, and the posterior and lateral portions of the left side of the head. These discolorations, which varied in intensity in different parts, appeared to bear no particular relation to the fractures, but extended

above and below them. The tissue covering the posterior part of the fractures (perhaps one-half of their length) only showed the discoloration. These discolourations were regarded by the doctor as bruises; in his cross-examination he spoke of them as being produced by infiltration; being asked what infiltration was, he replied, "Injection of the connective tissue with blood; it is very nearly the same thing as ecchymosis." Ecchymosis, he said, "can occur without a bruise; a rupture of a blood-vessel would cause it, whether it existed with a bruise or without it."

The skull-cap was next removed; a carpenter's back-saw was used, the blade of which was ten or twelve inches long, and three or four inches wide. The first saw-cut commenced on the right side, was continued around the front and on the left side, and terminated at the back of the head, just beyond the median line. A second cut at the back of the head was made higher up than the first, with which it communicated at a point in the left parietal bone, one inch anterior to the lambdoidal suture. This cut extended on the right side of the head to a point one and a quarter inches below the parietal eminence. A third cut commenced on the second cut, one and a quarter inches from its extremity on the right side, and ended at the beginning of the first cut on the same side. (See Figs. 1 and 2.) Subsequently a large part of the muscular tissue in the temporal regions was rudely dissected from the skull. A flattened conical ball, weighing twenty-six and a quarter grains, was found lodged in the middle of the right cerebral hemisphere. It had not struck the skull on the right side of the head. Its base fitted the shells of the metallic cartridges used in Fero's pistol.

After the dissection, the face was washed. In the evening of the same day, a dark discoloration was observed of the upper lid of the right eye, and at its inner angle. There were also reddish marks about the face, which appeared to certain witnesses as if a hand had been pressed upon the face, the thumb on the right side extending to the eye, while the fingers were upon the left cheek; others stated that the marks were irregular and crossed each other.

December 2d—eight days after death—another examination was made. The main fractures were measured, and a fracture was observed of the right supraorbital plate; near its centre loose fragments of bone were found, which were removed, leaving an aperture a quarter of an inch in diameter. After the examination, the head was cut off and placed in a vessel with ninety-five per cent. alcohol. The liquid was poured off after a few weeks, and the vessel filled with fresh alcohol of the same strength.

April 28, 1869, the head was brought to Albany, and examined by Dr. A. Van Derveer (Professor of General and Special Anatomy in the Albany Medical College), and Dr. George T. Stevens; none of the tissues were removed by them, but portions were sent to them a week afterward. April 29th, the head was examined by Drs. J. R. Boulware, L. Cross, and C. H. Porter, who removed specimens from different parts, which will be designated hereafter.

The theory of the prosecution was, that Mrs. Fero was murdered by her husband; that he fired a ball into her head with his Smith and Wesson's pistol; that he struck her numerous blows upon both sides of the head, also upon its front and back, with some broad, heavy, elastic body, making the fractures found

in the skull. As there were ledgers in a desk in the kitchen, it was suggested by a medical witness that one of these might have been used to strike the blows. That the discolorations about the fractures were bruises, the result of the blows; that the money found after the murder in the desk (something over \$100) was his own, and rendered his story regarding his missing pocket-book highly improbable.

Numerous medical witnesses were called by the prosecution, who testified substantially: first, that the discolorations observed about the head were bruises, the result of external violence; second, that a pistol-ball could not make the fractures found.

The views of Dr. Case, who made the first *post-mortem* examination, have already been given in the account of that dissection. The physicians who were present at the second examination concurred in his opinion. Two witnesses called as experts by the prosecution (Drs. Van Derveer and Stevens), who first saw the head April 28th, swore that the muscular tissues of the head and the tissues around the right eye were bruised. Thus, Dr. Van Derveer said, the tissue over the left temporal region appeared bruised, the back part of the head had apparently been pounded, there was a slight ecchymosis under the right eye; and Dr. Stevens said that the scalp was mangled, bruised, and discolored in parts. They stated that they formed the opinion that the head was bruised—1. By the appearance of the tissues; 2. By cutting into them; and 3. By a microscopic examination of them. We will notice these points in order.

1. In regard to the appearance of the muscular tissue little need be said; it was in parts dark in color, darker certainly than if ordinary muscular tissue had

been soaked in dilute alcohol, firmer and more contracted. The temporal muscles, instead of having smooth surfaces and their natural form, as they would have had if they had been carefully dissected from their attachments, were uneven, rough, and haggled, and hanging in coarse shreds. This deeper color and rough condition may have suggested to their minds *ante-mortem* injuries, but certainly cannot be regarded as furnishing satisfactory data for the formation of a positive opinion.

2. By cutting into these tissues, exposed to the action of strong alcohol five months, what peculiarities of color and consistency were observed proving bruises? How did these tissues differ from healthy muscular fibre, or that infiltrated with blood, and exposed to the same influences? No information was given on these points, and no evidence furnished that either of these gentlemen had before seen any tissue which had been thus exposed for a considerable time, or had made a single experiment to elucidate the point. Without a proof of such knowledge or experiment, it seems unsafe to regard their opinion as conclusive upon the subject.

3. It was stated, however, that, of the three modes adopted for determining that the tissues were bruised, they regarded their microscopic examinations as the most reliable. Let us briefly consider the nature of these examinations, which were so satisfactory to these experts that they were willing to deliberately swear that the tissues of Mrs. Fero's head were bruised.

Both Dr. Stevens and Dr. Van Derveer state that they saw broken muscular fibres, in certain specimens of tissues from Mrs. Fero's head, which they examined under the microscope with powers magnifying objects

from seven hundred to one thousand diameters. We do not question the accuracy of their observations in this particular; but of what importance is it in determining whether or not the tissues were bruised, whether blows were struck before death?

According to Bowman, the average diameter of the ultimate muscular fibres of the human female is one four hundred and fifty-fourth part of an inch; these are bound together by connective or cellular tissue into small bundles, and these again into larger ones, which constitute muscle or lean flesh. In order to examine these ultimate muscular fibres, the usual method is, to take a small portion of a muscle as fresh as possible, but after it has lost its contractility, and, using magnifying glasses, the particle is torn under water into fine shreds by means of needles. The connective tissue is so strong that force must be used to separate the ultimate fibres, which as a consequence are in parts irregularly broken or torn. The specimens thus prepared may then be submitted to examination under a high power of the microscope, in such a condition as to exhibit most of the important points in their structure.

In this case, however, broken muscular fibres were not found in *fresh* specimens from Mrs. Fero's head, prepared by the above or similar manipulations, but only in specimens of the tissue after it had been subjected to the action of strong alcohol five months. But, as has just been said, the above method of preparing fibres for examination is very certain to break them. Even were this not necessarily so, would it be safe or wise to say that the delicate muscular fibres were not broken during these manipulations, when the bulk of the material worked upon in each case was much smaller than the head of a pin? But this is by no

means all: it is necessary to bear in mind the treatment the head had undergone before these examinations. It had been subjected to the action of saws, knives, and fingers, during two *post-mortem* examinations; to burial and exhumation; to repeated handling in Davenport, Delhi, and Albany; it had been placed on wooden tables and marble slabs, and the muscular parts had been cut, pulled, and separated from each other at different times and places. It would be strange, indeed, if thousands of fibres were not broken during these operations, as undoubtedly they were—this even a casual examination would show—and stranger still if broken fibres were not detected when the tissue was examined under the microscope. Both of these experts, on their cross-examination, admitted that they could not determine by the microscope whether the fibres were broken before or after death; we agree with them in this, and hence fail to see how their discovery of broken fibres, under the actual circumstances, was the slightest evidence of blows or bruises.

Dr. Stevens saw not only broken muscular fibres, but also some other objects which he thought might be fibrin. Let us examine into this. The blood contains, besides water, blood-globules, albumen, and fibrin. The coagulation of blood is caused by the spontaneous solidification of the fibrin, as a net-work of filaments, which entangles the blood-globules, and forms a mass called the clot. The albumen remains liquid, and is gradually forced out as the clot contracts. If blood is placed in alcohol, the albumen solidifies in minute granules. The albumen being thirty to forty times as abundant as the fibrin, when both of these constituents are solidified, which takes place when blood or a tissue containing blood is placed in alcohol,

the filaments of fibrin cannot be distinguished, as they are concealed by the albuminous granules. The same condition was induced when Mrs. Fero's head was immersed in alcohol. Although the blood had coagulated, the fibres were surrounded by a liquid containing albumen, which soon formed granules, and concealed the fibrin-filaments. Hence, it seems unreasonable to believe that Dr. Stevens saw fibrin, as he thought probable. The following question was proposed to the same gentleman (a question which, properly answered, was regarded by the defence as of great importance) : "Can you distinguish between a piece of flesh stained only with liquid blood, then soaked in alcohol, and afterward bruised, and a piece of flesh bruised before death, and then soaked in alcohol?" He replied that he could not distinguish between them.

Dr. Van Derveer found in the specimens examined by him broken ultimate muscular fibres, also some healthy muscular fibres. He likewise stated that he observed *fragments of broken blood-globules driven into the ultimate muscular fibres*. This statement is of such a character that its mere announcement might be regarded as its sufficient refutation; but, lest injustice be done to the expert who made it, it is proper to submit it to examination. The blood-globules of man have an average diameter of one three-thousandth of an inch. They are not solid bodies, but, on the contrary, have a consistency which is very nearly fluid. They are homogeneous, and are not provided with an investing membrane. It is these minute, almost fluid bodies, we are told, which were shattered by blows upon the head, and their fragments—fluid be it remembered—forcibly driven into the solid ultimate mus-

cular fibres, the average diameter of which is one four hundred and fifty-fourth part of an inch. And this observation, it should be borne in mind, was made not upon fresh blood-globules, but upon the alleged fragments of blood-globules which had been subjected to a five months' immersion in ninety-five per cent. alcohol.

It appears that, after this long immersion of the tissue in alcohol, Dr. Van Derveer swears that he positively identified, as fragments of blood-globules, certain particles which he saw in specimens of the tissue examined under the microscope! Moreover, he swears that he saw these fragments of blood-globules (fragments of fluid bodies) embedded, like wedges in a log of wood, in the substance of the solid ultimate muscular fibres, where, we are asked to believe, they had been mechanically driven five months before, by the force of blows which were assumed to have been struck upon the head of Mrs. Fero. But, even if we admitted the correctness of the observation, and that blows might produce such effects, of what importance is it in the case, when we are unable to determine whether the condition described was produced before or after death?

There were no external marks of injury about the head, such as are known to result from severe blows like those which were assumed to have been struck. How was this accounted for? Experts called by the prosecution cited cases of injury to the trunk, lacerating different organs without producing external injury. Such cases, it may be stated, are by no means uncommon, but fractures of bones without external marks are more infrequent; so that Guy says, "When severe injuries of hard parts, such as fractures of bone, are unattended by a bruise" (of the skin), "there is a

strong presumption against these having been caused by a blow,"—(*Forensic Medicine*. London, 1868, p. 288.)

Common experience teaches us that comparatively light blows about the head are followed by swelling, ecchymosis, and even laceration of the scalp. How much more likely, then, that these external marks should appear when blows are struck upon the head severe enough to fracture the skull—when blows are struck upon a part, as the parietal eminence, where the bone is thick and arched either way! How remarkable it is that repeated blows could have been struck on both sides, on the front and back of Mrs. Fero's head, as it is assumed they were, and yet not leave a trace of injury at any point! But, that the truth may be fully presented, a case must be noticed (the only one of the kind I find reported; it was not referred to at the trial) which seems to show that the view entertained by the prosecution, although highly improbable, may be regarded as possible. It is given by Casper; the essential points only are quoted:

Rupture of the Brain from being run over. No external mark.—“An aged tailor was run over and killed. The whole body, and particularly the head, evinced not the slightest trace of injury, and yet there was a fissure of the skull, extending from the end of the sagittal suture to the middle of the squamous portion of the left temporal bone. There was a rupture of the brain about an inch in length and width.”—(*Casper's Forensic Medicine*. London, 1861. Vol. i., p. 114.)

As regards the fractures in the skull of Mrs. Fero, the medical witnesses called by the prosecution testified that, in their opinion, they could not have been made by a pistol-ball.

The defence was based negatively upon the following considerations:

1. That Fero had no motive for the commission of the murder, or, at least, that no motive was proven.

2. That his physical condition was such as almost to preclude his committing the alleged violence.

3. That the appearance of Mrs. Fero, and her surroundings at the time of the discovery of the murder, rendered the theory of the prosecution untenable.

These points will be considered in order:

1. The prosecution examined a number of witnesses for the purpose of proving an improper intimacy between the accused and a Mrs. M., whose husband was a cooper. It was testified to that Fero was in the habit of going frequently to Mrs. M.'s house, and to the shop, and that there were rumors of improper relations existing between the two. It was proved by the defence that Mrs. M. had charge of the financial affairs of the family and business; that she purchased family supplies from Fero, and was occasionally in debt to him; and that he, at different times, took mortgages on her hog, cow, watch and chain; that Mrs. Fero, to the time of her death, was on friendly terms with Mrs. M., and mentioned to her (Mrs. M.) the stories alluded to above regarding herself and Fero. When Mrs. M. heard these stories, her husband and herself went to Fero, at his store, and confronted the parties who had circulated the reports. They all denied having seen any thing improper between them; one remarked that he only wanted to have a little fun with the squire. It was also proved by the defence, the witnesses being neighbors and near relatives of Mr. and Mrs. Fero, that the accused and his wife lived happily together. No evidence to the contrary was given, and no intimation made that any difficulties or unpleasant relations of any kind had ever occurred between them. The store was sold with Mrs. Fero's approval the day before her murder, and a mortgage

running ten years was taken for a part, and notes due at long dates given for the balance.

2. Fero had been out of health since October, and, for a few weeks before the murder, was unable regularly to attend to business. His wife had charge of the store while he remained at home, posting books and taking care of the house. The money found in the desk was assumed by the defence to be that collected in the store by Mrs. Fero. The accused was quite feeble, dependent upon his wife, and apparently was not in a condition, physically or mentally, to inflict such violent blows as were alleged to have been given.

3. The prosecution assumed that the injuries were inflicted while Mrs. Fero was in bed, but did not specify whether the alleged blows were given before or after the pistol-shot. It seems probable, to say the least, that, if blows sufficient to produce the fractures were struck *before* the pistol-wound was made, blood-vessels within the skull would have been ruptured, and that a considerable quantity of blood would have been found in the cranial cavity, which was not the case. If blows were struck upon different parts of the head, as alleged, *after* the pistol-wound was made, the blood which was flowing from the wound would have been spattered in different directions. But the contrary was the fact; the blood had flowed quietly in but one direction, proving that the position of the body had not sensibly changed after the bullet entered the head. There is another fact that seems inconsistent with the theory that blows were struck. That fact is, the folded woollen cloth lying over the stomach of Mrs. Fero. If she had been struck upon different parts of the head, the body must have been moved, and, in all

probability, there would have been a struggle which would have disarranged if it would not have caused the cloth to have fallen off. On the contrary, it was found folded, lying smoothly over the stomach where her physician had ordered it to be placed.

The theory of the defence was :

1. That there were no bruises upon the head.
2. That the fractures of the skull were the result of the pistol-shot, and the unskilful manner in which the skull-cap had been removed.
3. That the discoloration of certain parts was the result of the infiltration of blood from vessels ruptured by the fractures of the skull.

These points were elaborated by Drs. Boulware and Porter, and by Dr. Cross, experts called by the defence. A brief *résumé* of their opinions and reasons for holding them will be presented :

1. *There were no bruises upon the head.* The importance, in this case, of determining whether or not there were bruises upon Mrs. Fero's head cannot, perhaps, be better shown than by quoting, from the judge's charge to the jury, his remarks upon this point. He said :

"On the part of the prisoner, it is claimed that no other violence was used upon her person, except by shooting her with a pistol. Now, gentlemen, what is the truth respecting this proposition? And, in determining this proposition, it is material for you to ascertain, from the evidence, whether there were any bruises upon her head which must have been inflicted by blows previous to her death. As I understand the evidence of the medical witnesses, it will be unsafe for you to find that blows had been inflicted upon her head unless you are satisfied that the flesh or muscle between the scalp and the skull had been bruised. If there was no bruise of the flesh or muscle found upon her head, then, gentlemen, upon the testimony of the medical witnesses, I think it would be unsafe to find that blows had been inflicted upon her head—not that I have come to any fixed and irrevocable conclusion in my mind upon this question—but, before you can find such a proposition, you must be satisfied beyond a reasonable doubt."

of its truth. You will recollect that the coroner, Dr. Case, Dr. Fitch, and Dr. Calhoun, testify that in their judgment there was bruised flesh, or tissue, or muscle, and you will recollect the testimony of Dr. Stevens and of Dr. Van Derveer as to how much, if any, their evidence corroborates the testimony of the four physicians I have named. You will also recollect the evidence of Dr. Covell. You will recollect the evidence of Dr. Porter, who made the examination and tests; the evidence of Dr. Boulware and of Dr. Cross upon this question, and all that has been read from the medical books touching it, and what has been said bearing upon this question by any other witnesses whom I have not named.

"Now, gentlemen, are you satisfied beyond a reasonable doubt, from the evidence of these witnesses, and all that there is in the case, that there were bruises upon the head of the deceased which must have been caused by the infliction of blows, and that those blows produced the fractures upon or in her skull other than the one immediately surrounding the hole made by the pistol-ball? If you are, then you will have come to a conclusion which is of most importance to the people in establishing the guilt of the prisoner; for, if blows were inflicted upon this woman's head sufficient to fracture her skull, it so entirely contradicts, or is so entirely in conflict with the story told by the prisoner, that you will have very little doubt of the conclusion that he must have inflicted the blows and fired the pistol. If you are not satisfied beyond a reasonable doubt that there were bruises caused by blows, then, gentlemen, it is safer in a case of this description to adopt even an uncertain theory, and find that the pistol-ball may have produced the fractures upon this woman's skull as well as making the hole in her skull."

Before considering the question of bruises, we will briefly define certain terms, that there may be no misunderstanding when they are afterward employed.

Contusion (or bruise) is an injury in which tissue is broken down by mechanical violence, and blood extravasated into the injured part. The blood coagulating becomes, as it were, incorporated into the broken tissue.

Echymosis is the discoloration produced by the blood extravasated into a contused part.

Infiltration is the discoloration produced by the effusion of blood into non-contused cellular tissue.

Suggillation is the discoloration produced by a congestion of the capillary vessels after death.

Cadaveric imbibition is the discoloration produced by the staining of tissue with the reddish fluid arising from decomposed blood.

We are well aware that exception may properly be made to these definitions, but we have adopted them as being, upon the whole, the best that we could suggest.

The discolorations of infiltrations may readily be mistaken for the discolorations from contusions, or either of these may be confounded with suggillation or cadaveric imbibition.

The life of a human being may depend upon determining which of these is present in a case undergoing legal investigation. That these distinctions are not always readily made, is the general testimony of those best informed on the subject. Thus Casper says:

"*Post-mortem* stains [suggillations] are a most important *post-mortem* appearance, because the inexperienced are liable to confound them with ecchymoses, and consequently with traces of violence committed previous to death; and, indeed, often enough do so confound them."—(Casper's *Forensic Medicine*. London, 1861. Vol. i., p. 19.)

Taylor (A. S.) remarks:

"There is what is called *cadaveric lividity*, which comes on during the act of cooling. At a still more advanced period dark livid spots or patches are met with in the skin, to which the name of *suggillation* or *post-mortem* ecchymosis has been given. These appearances have often been mistaken for the effects of violence applied during life, and serious mistakes have thence arisen. Innocent persons have been accused of murder or manslaughter, and have been tried on charges that have afterward proved to be groundless. Dr. Christison refers to two cases, in one of which two persons were convicted, and in the other three persons narrowly escaped conviction upon a mistake of this kind."—(Taylor's *Principles and Practice of Med. Jur.* London, 1865, p. 46.)

Again, Wharton and Stille remark:

"Suggillations deserve careful attention, because they may be easily mistaken by the inexperienced for ecchymoses or bruises, and, consequently, for traces of violence inflicted during life."—(Wharton and Stille, *Med. Jur.* Philadelphia 1860. § 951.)

Briand says :

"We are especially liable to fall into grave errors, when we seek to distinguish between ecchymoses, the sanguineous infiltration resulting from blows inflicted during life, and the purely mechanical phenomena resulting from the imbibition of liquids."—(Briand et Chaudé, *Manuel Méd. Leg.* Paris, 1869, p. 359.)

D'Ollivier (d'Angers) reports a remarkable case where the discolorations from cadaveric imbibition were mistaken for ecchymoses, the result of violence during life. It was only on the third *post-mortem* examination that the nature of the discolorations observed in the body were satisfactorily determined.—(*Annales d'Hyg. Pub. et de Méd. Leg.*, tome xxii., p. 202.)

The means of distinguishing between these different conditions is not in all cases so satisfactory as could be desired. Casper says of suggillations and ecchymoses: "These are, however, very easily distinguished from one another by comparing the results of incision in the parts discolored; no incision into a *post-mortem* stain, be it ever so deep or bold, will ever give vent to effused blood or coagulated blood: at the most there will be but a few bloody points, the result of cutting across some small veins in the skin, while, in the smallest ecchymoses, the effused blood will at once be brought to light by the incision. As this simple proceeding affords an infallible means, and there is no other of distinguishing between *post-mortem* stains and ecchymoses, so the medical jurist ought never to omit solving his doubts by making an incision, and individual medical referees or courts of reference are perfectly right, when this has been omitted, to impugn the statements of those who examined the body, with all their consequences."—(Casper's *Forensic Medicine*. London, 1861. Vol. i., p. 19.)

D'Ollivier (d'Angers) says :

"We may preserve in alcohol the different ecchymosed tissues, without the prolonged immersion making the blood disappear which has penetrated during life; the skin, for example, presents then a violet lees of wine color which remains almost indefinitely; on the contrary, the sanguinolent infiltration, which is but the effect of cadaveric imbibition, disappears very quickly, and does not leave its particular coloration in the infiltrated tissue."—(*Annales d'Hyg. Pub. et de Méd. Leg.*, tome xxii., p. 202.)

Briand, alluding to the above observation of d'Olivier, which he quotes, says: "It is this incorporation of the blood in the thickness of the skin which constitutes the essential character of ecchymosis (from blows), and which remains even when the tissue has been macerated in water or preserved in alcohol."—(Briand et Chaudé, *Manuel Méd. Leg.* Paris, 1869, p. 369.)

We may add that the discoloration of infiltrated tissues disappears by soaking in dilute alcohol, or by maceration in water. A longer time, however, is required to remove the color than in tissues stained by cadaveric imbibition.

In reference to these last tests, our ordinary experience confirms them, as an example or two will show. Thus the specimens of soft tissues (free from contusions), preserved in dilute alcohol, gradually lose their color, even when parts of them have been infiltrated with blood. Hunters often kill animals that they have wounded, by cutting their throats; the flesh around the incised wound in the neck becomes infiltrated with blood. If these parts are soaked in weak brine, the color disappears in a few hours. When, however, portions are contused or lacerated, as where the animals have been bitten by dogs, the discoloration of those parts remains. Again, the flesh of animals slaughtered by the butcher is in parts infiltrated with blood, which is rapidly removed if the meat is immersed in water, but the discolorations, made by contusions while the animals were living,

remain, and this is so even when the meat has been in brine for months, and afterward soaked in water.

In the case of Mrs. Fero, the season of the year and the short time after death when the *post-mortem* examination was made forbid the idea that any sensible decomposition had taken place. Hence the discolorations found were not the result of cadaveric imbibition. The fact, that discolorations were observed only upon the head, and in the vicinity of the fractures, renders it evident that they were the result either of contusions or infiltrations. If the tissue had been critically examined at the time of the first *post-mortem* examination, it would not have been difficult to have arrived at a satisfactory conclusion. But the head, with the skin and other tissues, remained for eight days in contact with blood, which was liquid at the time of the first examination, and was then placed in ninety-five per cent. alcohol. This alcohol was changed once, if not twice, before the examination in Albany. It is to be remarked that dilute alcohol is ordinarily used for preserving the soft tissues. When the head was examined April 29th, the tissues were firm and contracted. There was a reddish discoloration of the skin around the bullet-hole, which, passing from the hole, gradually diminished in intensity, until, at the distance of about two inches, the skin was as pale as in other parts. The skin around the left temple was slightly reddened, as was that in front of the right ear and near the right temple. There was also a dark discoloration upon the upper lid of the right eye, and at its inner angle. The temporal muscles were of a deep-red color; they had been dissected both from the scalp and skull, and presented rough, haggled surfaces, and hung in shreds, from the size of a finger to that of a knitting-needle.

April 29th, the following specimens were removed from the head :

No. 1. Skin and muscular tissue from right side of head adjoining the sawed surface, on a line with the mastoid process. The skin was distinctly, the muscles more slightly, discolored.

No. 2. Adipose tissue greatly discolored, from between the upper surface of the globe of the right eye and the supraorbital plate.

No. 3. Muscular tissue highly discolored from the left side of the head, just anterior to the bullet-hole.

No. 4. Highly-colored, blood-stained dura mater from the superior surface of the cranium, around the longitudinal sinus, containing shreds of coagulated fibrin and clots of blood.

No. 5. Muscular tissue and scalp from occipital bone near the sawed surface of the bone. The scalp was not at all discolored ; the muscular tissue was slightly discolored.

No. 6. Skin and muscular tissue from the temple, a little above and back of the right eye. The skin was slightly discolored.

These specimens were placed in water, when the color immediately began to disappear. At the end of four days the color had almost entirely disappeared, except from the thicker portions of certain of the specimens of muscular tissue, which were not wholly free from color until after six to ten days had elapsed. Specimen No. 4, however, was a marked exception to these results : although the color of the dura mater rapidly disappeared, the small clots of blood (considerably smaller than a pea) that were attached to it retained the same color that they had at first, as also their form, even after weeks of exposure ; the shreds of coagulated fibrin likewise did not change their appearance.

September 25th, the following specimens were removed from the head:

No. 7. Skin and muscular tissue from immediately around the bullet-hole, considerably discolored.

No. 8. Skin and muscular tissue from immediately above the outer angle of the right eye, somewhat discolored.

No. 9. Skin and muscular tissue from immediately above the outer angle of the left eye, not discolored.

No. 10. Upper lid of the right eye greatly discolored.

No. 11. Portion of left temporal muscle from a point a little above and back of the eye near the temporal ridge, somewhat discolored.

These specimens were placed in water, and in five days most of them entirely lost their color. The specimen No. 7, however, preserved its color for a distance of nearly an eighth of an inch around the bullet-hole—that part undoubtedly being contused. The specimen No. 11, a portion of the left temporal muscle, did not entirely lose its color until nearly ten days after being placed in water. Before giving our opinion as to the condition of the tissues on Mrs. Fero's head, we must report a few of our experiments, the results of which influenced us in coming to a decision.

I. Portions of the muscular tissue of beef, containing contusions, were immersed in ninety-five per cent. alcohol over five months; the contused parts still retained their color. Fragments of the same, after having been in alcohol six weeks, two months, and four months, respectively, were macerated in water twenty days or more, without the discoloration of the contused parts disappearing or perceptibly diminishing.

II. Specimens of the tissue from the forearm of a

boy, injured by a railroad accident, were taken forty hours after the accident, and twenty hours after the amputation, as follows:

No. 1. Skin somewhat discolored, and middle portions distinctly bruised. No. 2. Muscular tissue bruised. No. 3. Skin a little decomposed, color bluish white, corrugated; *tissue beneath slightly if at all bruised.*

Half of each of these specimens were placed in ninety-five per cent. alcohol, the other half in water. At the end of five months the parts placed in alcohol were found to have retained their color, with the exception of specimen No. 3, the color of which had in part disappeared. The parts placed in water retained their color (excepting No. 3), until decomposition took place. After three months' immersion in alcohol, a part of specimens Nos. 1 and 2 were placed in water, where they remained four weeks, without perceptibly losing their color.

III. The blade of a narrow scalpel was introduced beneath the scalp of a dog, and moved freely around to divide blood-vessels; when free haemorrhage was produced, the scalpel was withdrawn. A similar incision was made in one of the hind-legs of the same animal. After seven hours, the dog was killed by blows upon the head. The contused parts, treated with alcohol and with water, did not lose their color. Portions of areolar tissue were found in the head and leg, infiltrated with blood. These were immersed, part in ninety-five per cent. alcohol and part in water. The parts placed in water lost their color within twenty-four hours, and probably sooner, but were not earlier examined. The parts placed in alcohol soon lost a little of their color, but, after thirty days' immersion,

the color was almost the same as at first. By maceration in water the color gradually disappeared.

These and similar experiments that were made, prove: 1. That bruised tissue does not sensibly lose its color by maceration in water, after a prolonged immersion in alcohol. 2. That tissue infiltrated with blood, though losing its color in a limited degree by prolonged immersion in alcohol, loses it entirely when it is afterward macerated in water. As the specimens of the tissues taken from Mrs. Fero's head, after being immersed for five months in strong alcohol, entirely lost their color by subsequent maceration in water, we could come to no other conclusion but that the tissues were simply infiltrated with blood—that they were not bruised.

2. The fractures of the skull were the result of the pistol-shot, and the unskilful manner in which the skull-cap was removed.

The general experience of surgeons, as well as the results of our own observations, leads us to the conviction that blows could not be given on either side of the head with such force as to produce fractures like those found in Mrs. Fero's skull, without bruising the tissues between the weapon and the skull, though there might not be in all cases an open wound of the scalp. As, after careful examination and repeated experiments, we find no indication of bruises in the tissues of Mrs. Fero's head, we are forced to the conclusion that no blows of the character described were given, and we must account for the fractures in some other way. What is the most reasonable way of accounting for them, taking into consideration all the circumstances of the case? Our views on this subject we will now proceed to develop. Extensive fractures of the skull

by bullets are by no means rare, but few cases, however, are to be found in treatises on surgery, described with that detail which is desirable. The Army Medical Museum (Washington, D. C.), so rich in its various departments, furnishes numerous examples of this kind of injury. Our limited space allows us to present but three of these cases. We would here express our obligations to Dr. George A. Otis, U. S. A., Curator of the Museum, for furnishing us with facilities for prosecuting our investigations:

A. (No. 849, Surg. Sec. A. M. M.) A musket-ball entered the left parietal bone, about one inch from its posterior-inferior angle, making radiating fractures on the left side. The fractures extended from the bullet-hole as follows: one extended to the junction of the squamous and lambdoidal sutures; a second across the parietal and frontal bones, into the supraorbital plate near its inner angle; a third to a point on the coronal suture half an inch from the median line; and a fourth to a point on the sagittal suture, half an inch above its junction with the lambdoidal suture. The ball had apparently divided and passed out through two apertures on the right side, connected with which were extensive fractures.

B. (No. 5,345, Surg. Sec. A. M. M.) A musket-ball entered the right parietal bone an inch from the anterior-inferior angle. Fractures extended from the bullet-hole as follows: one across the frontal-bone into the right supraorbital plate; a second, a curved fracture, extended in the parietal bone, just above and around the upper part of the squamous portion of the right temporal, then into that bone, where it divided, one branch extending to the external orifice of the ear, the second branch to the posterior portion of the squamous suture; a third fracture passed across the parietal into the occipital bone, where it terminated near the median line.

C. (No. 276, Surg. Sec. A. M. M.) E. V., struck by a musket-ball in the forehead, at a point half an inch above the right eyebrow, carrying away both tables of the frontal bone, to the extent of one and one-fourth by two and one-fourth inches. A fracture reached through the parietal to within two inches of the occipital bone. The orbital plate of the right superior maxillary was fractured and depressed, and a fissure an inch long ran down the body of the bone.

We also present the following cases:

D. A canal-laborer, aged twenty-one, was shot through the head by a musket-ball. "In the middle of the right cheek there was an irregular roundish wound [the aperture of entrance], "about the size of a half-penny." "The aperture of exit was at the right mastoid process, and was a

triangular wound with soft, unecchymosed edges. The whole of the right side of the skull was shattered, and particularly the right great wing of the sphenoid, the temporal bone with its petrous portion, and part of the occipital bone."—(Casper's *Forensic Medicine*, vol. i., p. 276.)

E.. "A young man, aged nineteen, was found shot through the head, and while his watch was left in his pocket, the pistol with which the deed was done was awanting. . . . The ball had entered about the middle of the forehead, where the soft parts were lacerated in the figure of the letter M. There was no branding with powder in the neighborhood of the wound. The orifice of exit was in the occipital bone. The wound in the frontal bone was one inch in diameter, while that in the occipital bone scarcely admitted the point of the index-finger. The whole of the cranial vault was blown off, being only firmly connected with the occipital bone for the extent of two inches.—(Casper's *Forensic Medicine*, vol. i., p. 288.)

F. Mr. Thompson had been wounded in the head by a pistol-shot. The left temporal bone was fractured, and there was a wound in the scalp over the parietal bone, but no communication could be discovered between it and the wound over the temporal bone. Five portions of the depressed bone were removed. The man lived thirty-six hours. "On dissection it was found that the fracture extended from the temporal bone in one direction into the orbit, in another to the sagittal suture, and in a third to the mastoid process. Several loose portions of bone were found on the dura mater, which was discovered to be lacerated."—(Sir Astley Cooper's *Lectures on Surgery*. Philadelphia, 1839, p. 149.)

In the above cases, all the fractures in each skull communicated with one another; while, in the case of Mrs. Fero, the fractures on one side of the skull did not communicate with those on the other side. To account for this, we must consider the subject of *contre-coup* fractures. A *contre-coup* fracture may be defined as a fracture produced at a point other than that where the force is applied, and usually at a point distant, if not opposite.

A familiar illustration of the production of this variety of fracture may be seen when a pumpkin or watermelon is thrown upon the ground. Sometimes the fruit is fractured at the point of contact, at other times the fractures commence at a point immediately opposite the part struck, and frequently at points between the two. Surgical authorities generally acknowl-

edge the occurrence of *contre-coup* fractures of the skull. Thus Gross says :

"The older writers have much to say about fracture of the skull by *contre-coup*, and in reading their works we cannot fail to be impressed with the conviction that they considered it an accident of frequent occurrence. Modern research, however, has pointed out the fallacy of this conclusion, by showing that this kind of fracture ranks among the rarest lesions of this portion of the skeleton. The most common site of fracture of the cranium by *contre-coup* is the base of the skull, from blows upon the vertex. Here the force, instead of being expended upon the part struck, is diffused over the cranium, and finally concentrated upon the sphenoid, temporal, and occipital bones, which are either separated along the line of suture, or broken in their continuity. A similar effect is sometimes witnessed in the occipital bone from blows upon the frontal and in the parietal bone of one side, from blows applied to that of the other side."—(Gross's *Surgery*. Philadelphia, 1866, vol. ii., p. 186.)

Erichsen remarks :

"This kind of fracture has been described by some surgeons as of frequent occurrence, while it has been denied by others. There can, however, be no doubt but that it does happen, though less commonly, perhaps, than is generally supposed. Every hospital surgeon must have occasionally seen unequivocal instances of it. For its occurrence, several conditions are necessary. The skull must be struck over a large surface, as when a person falls with his head against the ground. If the blows alight upon a thin portion, this will be directly fractured; but if a dense and strong portion of the bone be struck, as the parietal eminence or the lower part of the os frontis, the shock transmitted through the cranium will cause the thinnest portions of the skull, though distant, to give way in preference to the stronger part on which the blow has immediately fallen. These fractures by *contre-coup* are most common at the base of the skull, and are commonly much radiated. They are never depressed."—(Erichsen's *Surgery*. Philadelphia, 1867, p. 283.)

Desault, after noticing the philosophy of the production of *contre-coup* fractures, of which it is stated that he had seen a great number of examples, says :

For their production "it is necessary that the motion be propagated generally throughout the whole cranium, which happens only when the striking body, being round and large, bruises an equally extensive surface of the cranium. On the contrary, if there is a sensible projection or point, the bone yields at the place struck, and the motion, being confined to that, cannot be propagated."—(Desault's *Surgery*. Philadelphia, 1814, pp. 12-14.)

Thus, while the general doctrine of *contre-coup* is admitted, some of the principal authorities consider that the cranium must be struck over a large surface, before the fracture can be produced. In regard to this, we will here only say that *contre-coup* fractures have been produced by a blow of the fist upon an arched part of the head, as upon the temple or parietal eminence, or in falling where the same parts have been struck, and that in these cases only a small surface of the head could have come in contact with the offending body. That a *contre-coup* fracture may be produced where the party is struck upon a thin part of the skull, as Erichsen appears to doubt, is shown by a case examined by Dr. Boulware, and which was legally investigated. A man received a single blow from the fist, on the left temporal bone, one of the thinnest parts of the skull. The party did not fall after receiving the blow, but was assisted to a seat; he lived two hours. At the *post-mortem* examination, a *contre-coup* fracture of the right temporal bone was found, two inches in length.

Our attention must now be directed to *contre-coup* fractures produced by bullets. Casper gives the following case:

G. "In this case, the bullet lodged in the brain. It was a buck-shot, with which a boy, aged thirteen, had been shot in the head. The bullet had entered through the left parietal bone, and had carried with it two small splinters of bone down to the left lateral ventricle, where they were found. The little bullet was discovered, completely flattened, lying at the base of the cerebellum. From the shot-hole in the bone a denticulated fissure extended *in an exceedingly rare manner*, viz., *horizontally* across the head, toward the right, where it ended in the middle of the lambdoidal suture, while by far the largest number of fissures in the cranial bones follow a vertical direction. We also found in the basilar part of the occipital bone a piece of bone the size of a bean, broken out and lying loose in the rest of the osseous tissue."—(Casper's *Forensic Medicine*, vol. i., p. 275.)

This case was presented at the trial, and great doubt was expressed by the prosecution as to its being a case of *contre-coup*. We regarded it as such for the following reasons: 1. A fair interpretation of the report leads to no other conclusion. 2. An experienced expert must be assumed to give all the material facts in a case he reports, and in this case nothing indicates that the ball had touched the basilar process and been deflected into the cerebellum. 3. Again, Casper evidently carefully examined the brain. As he mentions that small splinters of bone were carried down to the left lateral ventricle, a fact of no great interest, it seems unaccountable that he should omit to report, if present, such a remarkable and evident wound as one extending from the aperture of entrance through the brain to the basilar process, and then continued almost at right angles, passing through the medulla oblongata to the base of the cerebellum.

We present the three following cases of probable *contre-coup* fractures, contained in the Army Medical Museum. Photographs of these specimens were politely furnished us through Dr. Otis, curator of the museum. The backings of these photographs present histories of the specimens under the signature of the above-named gentleman, whose general reputation as a writer on surgical subjects, and whose official position, giving him rare opportunities for observation in this department, entitle his opinions to be received with great confidence:

II. (No. 830, Surg. Sec. A. M. M.) "A musket-ball entered at the centre of the left branch of the coronal suture, and passed out at the posterior-inferior angle of the right parietal bone, the opening of entrance being three-fourths and that of exit one and a quarter inches in diameter. There is a fracture of the right orbital plate of the frontal, of the squamous portion of the right temporal, and of the body of the right superior maxilla, prob-

ably by *contre-coup*. A fracture of the occipital bone extends from the opening of exit to the right jugular foramen. The frontal suture remains distinct, although the skull is that of a middle-aged man. The specimen is believed to have come from the Twelfth Army Corps Hospital after the second battle of Bull Run."

I. (No. 3,254, Surg. Sec. A. M. M.) "At a *post-mortem* examination of an unknown soldier at Lincoln Hospital, September 22, 1864, it was ascertained that a conoidal musket-ball had entered about one and a half inches above the left ear, causing a compound comminuted fracture of the squamous portion of the temporal bone. The ball was found embedded in the lower portion of the parotid gland." The specimen shows "penetration and fracture of the left temporal bone, just above and including the meatus auditorius externus, *with fracture of the occipital by contre-coup*, caused by a conoidal ball which is attached. The opening is just above the root of the zygoma, and is three-fourths of an inch in diameter. The condyle of the lower jaw and the posterior half of the glenoid fossa are carried away, together with the extremity of the petrous portion of the temporal bone, the line of fracture passing through the internal meatus auditorius. From the left jugular foramen, two lines of fracture pass to the foramen magnum, one in front of and the other behind the condyle. On the right side the occipital bone is traversed by a fracture, which runs from the foramen magnum to the posterior angle of the right parietal."

J. (No. 1,318, Surg. Sec. A. M. M.) "Skull exhibiting an extensive fracture from grape-shot. The missile entered the left parietal bone, near the lambdoidal suture, and emerged through the squamous portion of the temporal bone. *The bones forming the right orbit were fractured by contre-coup*. The specimen was picked up by Surgeon Frederick Wolfe, Thirty-ninth New York Volunteers, in June, 1863, under an abatis near the stone bridge over Bull Run, and is supposed to be the cranium of a Confederate soldier killed in the second battle of Manassas, August, 1862. At that action a portion of Longstreet's corps charged upon one of the Federal batteries in position near this locality."

Before presenting the results of certain experiments, it is important to call attention to the fact that fractures of the skull and other bones, laceration of internal organs, etc., are made with more difficulty on the dead than on the living subject. This truth, which is acknowledged by those conversant with the subject, is strongly insisted upon by Casper. Thus he says: "It is extremely difficult to break up the organic cohesion of dead organs." . . . "If we endeavor to fracture the skull of a dead adult, we shall find that an amount of

force, which, if applied during life, would indubitably have produced fissures, if not fracture or complete smashing of the skull, leaves the dead skull quite uninjured." "The most powerful blows struck downward upon the body laid horizontally were mostly without result, and only after repeated violent blows were we enabled to produce perhaps one or a few fissures in the occipital or parietal bones, or in the temporal bone (squamous portion), and certainly more easily in the latter. We were unable to produce more considerable effects, such as complete smashing of the skull, or fissures of its base, even in one single instance. The dead scalp seems to have considerably more power of resistance than the living one, and, after its removal, fissures of the bone were more easily produced by similar blows (vol. i., p. 245). And, again, "the result of my experiments on the dead body in regard to gun-shot wounds could only be to make more complete the proof of the resistance of the dead corporeal tissues, in contradistinction to the same tissues when alive, after I had already learned this peculiarity from my experiments with contused wounds, and this peculiar resistant property was found to be confirmed in a most remarkable manner."—(Casper's *Forensic Medicine*, vol. i., p. 271.)

We will now call attention to the following experiments :

K. A subject, a woman aged thirty-two, with the head still attached to the body and the integuments in their natural condition, was placed with its back upon a table. A pistol was fired at right angles to the head, at a distance of eighteen inches, making a wound on the left side. The pistol was a Smith and Wesson's small-sized revolver; a metallic cartridge was used, having a conical ball weighing twenty-nine grains. The ball entered the squamous portion of the left temporal bone, one and a half inches above the external orifice of the left ear. The squamous portion of the bone was shattered, the squamous suture loosened, and small fragments of the occipital bone detached. A fracture extended anteriorly from the bullet-hole,

through the left parietal eminence, and, passing to the right, upward and backward, terminated five-eighths of an inch above the right frontal eminence. (See Fig. 3.) The skull-cap was removed, and accidentally dropped

(K.) FIG. 3.



Extensive fractures of a skull by a pistol-ball. Left side. A. Ball-hole. B. Great fracture on left side. C. Saw-cut.

(K.) FIG. 4.



Extensive fractures of a skull by a pistol-ball. Right side. B. Continuation of great fracture on left side. C. Saw-cut. D. Fracture on right side. (See Fig. 3.)

from the dissecting-table to the floor. It was afterward cleaned, when a fracture of the external table was found, one and a half inches in length, extending from the right parietal eminence toward the coronal suture.

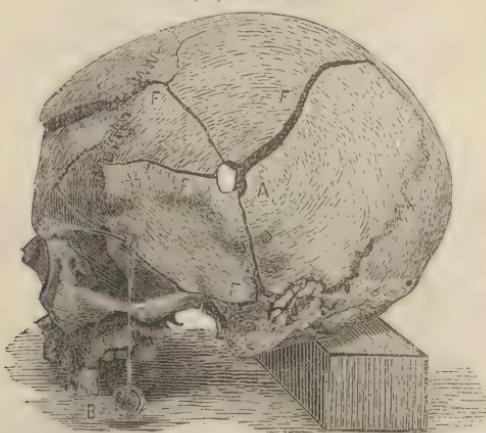
(See Fig. 4.) The general course of the fracture on the left side and on the front of the specimen corresponded with that in Mrs. Fero's head.

That the fracture on the right side was caused by *contre-coup* cannot positively be stated, though it appears to us more probable than that such a fracture in that position could have been caused by so slight a fall.

L. A subject, a man, aged forty-five, with the head still attached to the body, and the integuments in their natural condition, was placed with its back upon a table. Fifteen shots from a small Smith and Wesson's pistol were fired at different parts of the head, at distances varying from six inches to six feet. In three shots, the ball did not pass through the parietal bone, but remained embedded in the scalp and external table. The greatest fracture produced was half an inch in length; it was in the squamous portion of the left temporal bone, weakened by other shots.

M. A subject, a woman, aged forty. The conditions were the same as in the above experiment. Eighteen shots were fired in different parts of the head. The greatest fracture produced was one-third of an inch in length, in the right parietal bone between the apertures made by two bullets.

(N.) FIG. 5.

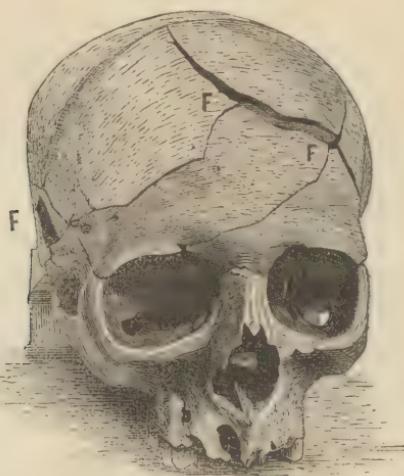


Extensive fractures of a skull by a pistol-ball. Left side. A. Ball-hole. B. Ball. F. Fractures.

N. A subject with the head still attached to the body, covered with the integuments, and these in their natural condition, was placed with its back upon a table. At pistol was fired at the head, at a distance of from twelve to fifteen feet. The pistol had a barrel nine and three-fourths inches in length, was rifled, and had a calibre of thirty-hundredths (.30) of an inch; the round ball used weighed forty-six grains. The ball entered near the centre of the left parietal bone, passed through the brain, and was found, flattened, lying near the petrous portion of the right temporal bone, which

showed signs of its impact. The skull was fractured in various directions, so that, when the flesh was removed, the face portion, and also a large fragment of the frontal and right parietal bones, separated from the rest.

(N.) FIG. 6.



Same as Fig. 5. Front. F, F, F. Fractures.

(N.) FIG. 7.

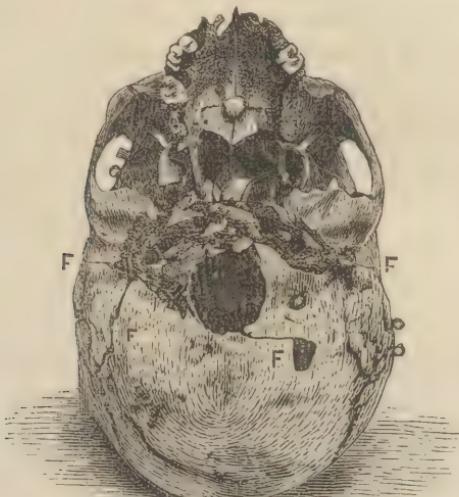


Same as Fig. 5. Right side. F, F, F. Fractures.

The left side of the skull was completely shattered, fractures extending to the sagittal suture, to the petrous and squamous portions of the temporal bone; across the frontal bone in various directions, one extending to the

right supraorbital notch, another to the squamous and petrous portions of the right temporal bone. The base of the skull was shattered, the fractures in it communicating with those on either side. This brief description gives but a very imperfect idea of the extent and number of the fractures in this remarkable specimen. (See Figs. 5, 6, 7, 8.)

(N.) FIG. 8.



Same as Fig. 5. Base. F, F, F, F. Fractures.

The specimen N is No. 1,308 of the collection of Dr. Jeffries Wyman, Professor of Anatomy in the Massachusetts Medical School (Boston, Mass.). The fractures were produced in an experiment made by Dr. Wyman as above described. We would here express our obligations to that gentleman for his politeness in loaning us so valuable a specimen, and for furnishing us with details of his experiments.¹

Although the histories of two of the specimens (H and J) from the Army Medical Museum are incomplete, and the fall of the specimen K throws doubt

¹ Stereoscopic pictures (eight in number), showing the above views of a fac-simile of Mrs. Fero's skull, and of specimens K and N with their fractures, form part of the series of pathological stereographs published by E. S. M. Haines, 478 Broadway, Albany, N. Y.

as to the cause of the fracture on its right side, yet it seems but reasonable to conclude from all the evidence that *contre-coup* fractures are sometimes produced by small balls. That such fractures are not more frequently observed is not surprising, for the number of gunshot wounds of the head in which the skull is critically examined is comparatively small, and, unless attention is particularly directed to the point, *contre-coup* fractures are likely to be overlooked, especially if the skull is not most carefully cleaned. In civil life, of the few gunshot wounds of the head that occur, a large proportion are by accident, and but a small proportion of the whole are investigated. In the army, of the thousands of persons struck in the head by bullets, a very large proportion die on the battle-field or in the field hospitals, and but comparatively few *post-mortem* examinations are made. From a consideration of the facts mentioned, we have come to the conclusion that it is not unlikely that there was a fracture by *contre-coup* on the right side of Mrs. Fero's skull.

Another point must now be inquired into, viz., the danger of making or extending fractures while removing the skull-cap. Shaw, in his "Manual of Anatomy," says: "The question whether there has been a fracture of the cranium previous to death is sometimes more difficult to decide than a person who is not accustomed to make dissections would imagine. If the fracture has occurred immediately before the patient's death, there will be coagulated blood found upon the bones and in the fissures; if the patient has survived for some time, there will be marks of inflammation and perhaps pus in contact with the skull; *but, if a fracture has been produced in making the examination (which sometimes happens in even very careful dissect-*

ors' hands), the blood in the fracture will not be coagulated, nor will there be any effusions around the portions."—(Quoted in Beck's *Medical Jurisprudence*. Philadelphia, 1863, vol. ii., p. 27.)

"Mr. Alcock some time since stated in a public lecture in London that he had known a fracture of the base of the skull produced by the awkward and violent tearing of the upper portion by the saw not penetrating enough to divide the bones, and this was mistaken by the inexperienced operator for fracture of the skull, producing death. Being a medico-legal case, it might have led to melancholy consequences had not the error been detected by an observer."—(Beck's *Medical Jurisprudence*, vol. ii., p. 28.)

The correctness of the statements quoted above will be confirmed by those who have had a large experience in making *post-mortem* examinations. Thus Dr. Boulware said at the trial that he had seen a good many skulls fractured while removing the cap; and that, of the hundreds of autopsies he had made, he had frequently fractured the skull, and that where a saw was employed, when not making the examination with a view of ascertaining the cause of death. It is apparent that the danger of fracture will be the greater the more unskillfully the dissection is made. The following observations were recorded at the time of the examination of Mrs. Fero's head, at Albany, April 29th: 1. At the junction of the second saw-cut with the first, the saw had not marked the skull on the lower side of the first cut. It was the same at the junction of the third cut with the second, the saw had not marked the skull on the lower side of the second cut. The condition of the parts showed that the saw must have lacerated the brain before the second and

third cuts were completed. 2. Where the saw-cuts met, the saw had not completely divided the bone, but *it had been forcibly broken across*; this was very evident at the junction of the first and second cuts, and less so at the junction of the second and third cuts. 3. On the right side, the third cut, instead of being straight, was slightly curved, and near its middle were the rough marks of comparatively coarse saw-teeth, showing that the saw had pinched while attempting to make the third cut connect with the first. This fact shows that the surrounding parts must have been under a constant strain during the sawing of the third cut.

These various evidences of unskilfulness, together with the pressure of the hands in attempting to hold the skull-cap steady while the operator was forcing the pinched saw along the sawed surface, lead us to the conviction that not only the fractures might have been, but in all probability were, greatly extended in removing the skull-cap. This view is rendered the more probable if we bear in mind the location of the tissues that were perceptibly discolored. Dr. Case says that he discovered infiltration (of the tissues) in the posterior portion of the right side, and the posterior and lateral portions of the left side of the head, and a very slight bruise (infiltration) on the forehead. Now, Shaw well observes that there will be no effusion of blood around parts fractured during examination; hence the fractures must have been extended, for Dr. Case swears as above, and in other words, that the areolar tissue over the posterior part of the fractures—perhaps one-half of them—showed this injection of blood, the other half did not.

The most reasonable conclusion that we can draw from our examination, and the only one that appears

to accord with the facts, is, that the fractures found in Mrs. Fero's head were the result of the pistol-shot, and the unskilful manner in which the skull-cap was removed.

3. *The discoloration of certain parts was the result of infiltration of blood from vessels ruptured by the fracture of the skull.*

All the tissues are nourished by blood which is supplied by vessels permeating every part, as well the bone as the pericranium, areolar tissue, scalp, and muscle. This being so, it is difficult to see how any part of the living body can be divided without giving rise to more or less haemorrhage. It is true that usually the smaller arteries contract and their orifices close when they are lacerated, but this is not so with the veins. Moreover, grooves are found on the external and internal surfaces of the skull in which vessels are lodged, and are so firmly bound to the bone that they cannot contract when they are ruptured. Hence, when a cranial bone is fractured, blood is poured out from the ruptured vessels. The quantity of blood that may be effused varies indefinitely with the number and size of the vessels ruptured, the activity of the circulation, the length of time the person lives, etc. The blood may collect in circumscribed masses, or become infiltrated through the surrounding tissues, though usually both phenomena are observed. The extent to which infiltration takes place depends upon the quantity of blood poured out, and the nature and condition of the surrounding tissues.

Common experience teaches us that infiltration frequently extends a considerable distance beyond an injured part; thus, a person receiving a blow above the eye may have a dark discolouration from infiltration

below the orbit. Occasionally, after an injury of the thigh, the infiltration will extend upward toward the hip, and not unfrequently as far down as the knee. A similar extensive infiltration of the soft parts around the fractured bone of a limb is not very infrequent, as every surgeon knows. Even after venesection at the bend of the elbow, the blood sometimes infiltrates the tissues as high up as the axilla, and as far down as the lower third of the forearm.

These and similar facts lead us to regard the infiltrations found in Mrs. Fero's head as the result of the fractures of the skull, not an uncommon or surprising result, but such as is usual, and to be expected as a matter of course. That the discoloration of the tissues around different portions of the fractures varied in intensity was to be expected, for the same size and number of blood-vessels are not found in all parts of the tissues; and again, because a part of the vessels may have been only lacerated, and so more apt to bleed than if completely divided.

The discoloration about the right eye was not observed until the evening following the murder, although, at the time of the dissection, the right side of the head was free from blood, and there was nothing to prevent any thing unusual about the part from being seen. This is readily accounted for, if we remember that the blood was liquid at the time of the dissection, and if it be conceded that the fractures were extended while removing the skull-cap. Under these circumstances there would be no sensible effusion around the extended fractures, where the tissue was almost immediately removed. But the liquid blood, passing through the aperture made by the fracturing of the supraorbital plate, would gradually infiltrate

through the loose areolar and adipose tissues in the back of the orbit, and after a time become visible externally. The fact, that the tissues far back in the cavity were more discolored than those in front, is another proof that the discoloration, which was gradually developed about the eye, was owing to the infiltration of blood from the fracture of the supraorbital plate. The pressure of the hands upon the face during the *post mortem* sufficiently accounts for the temporary discolorations which were found upon the face.

We may conclude our review of this case by the following comments on the chief points presented during the trial :

1st. That while Fero's story is remarkable, and was regarded by the prosecution as unworthy of credit from its very nature, there is nothing impossible in it, and nothing proved necessarily inconsistent with it. The fact that the base of the flattened ball found in the head of the deceased fitted the shells of the metallic cartridges used in Fero's pistol (a Smith and Wesson's), though suspicious, is not in itself of great importance, from the fact that the same-sized metallic cartridges are used in a variety of pistols in common use. The manufacturers of Smith and Wesson's revolvers inform us that they have made one hundred and fifty-eight thousand pistols of the same calibre as that in Fero's possession, and which was No. 60,210.

2d. That, while the prosecution assumed that the discolorations on the head of the deceased were bruises, and were the result of external violence (blows upon the head), the evidence of the defence was to the effect that the discolorations were simply infiltrations of blood, occasioned by the staining of the tissues with

blood poured out from vessels ruptured by the fractures. The experimental and other evidence on this point, given by the medical witnesses called as experts by the defence, was so satisfactory, if not conclusive to the prosecution, that they did not cross-examine these witnesses upon the subject.

3d. That, while the prosecution assumed that the fractures were the result of external violence (blows upon the head), the defence showed that the surrounding parts did not exhibit any of the ordinary characteristics of such injuries. They accounted for the fractures as being produced by the pistol-ball, and the unskilful manner in which the skull-cap was removed. In developing their views, the experts showed—1. That extensive fractures of the skull may be made by musket and pistol balls. 2. That *contre-coup* fractures may in all probability be made by musket and pistol balls; and 3. Authorities for and instances of fracture of the skull by unskilful manipulations in removing the skull-cap.

After a clear and elaborate charge by the presiding judge, the jury retired, and, after being out two hours, brought in a verdict of "Not Guilty."

Maudsley on the Mind.

The Physiology and Pathology of the Mind. By HENRY MAUDSLEY, M. D., Physician to the West London Hospital. 8vo, pp. xv-442 (tinted paper). . . . Cloth, \$4.00

Dr. Maudsley's aim in the preparation of this volume has been to treat of mental phenomena from a physiological rather than, as has hitherto been the habit, from a metaphysical point of view, and in his history of the inductive method, as applied to the interrogation of the mind, he shows conclusively that self-consciousness—the favorite resort of the schoolmen—is inadequate, contradictory, and unreliable. No book of the present day, devoted to the study of the mind, has attracted more attention or caused more comment than this. It is one of those works which mark the beginning of a new era in the study of mental science, and at the same time it is conceded on all sides to be, in its practical portions, a most reliable guide for the diagnosis, description, and treatment of insanity.

"Dr. Maudsley has had the courage to undertake, and the skill to execute, what is, at least, in English, an original enterprise. This book is a manual of mental science in all its parts, embracing all that is known in the existing state of physiology. * * * Many and valuable books have been written by English physicians on insanity, idiocy, and all the forms of mental aberration. But derangement had always been treated as a distinct subject, and therefore empirically. That the phenomena of sound and unsound minds are not matters of distinct investigation, but inseparable parts of one and the same inquiry, seems a truism as soon as stated. But strange to say, they had always been pursued separately, and seen in the hands of two distinct classes of investigators. The logicians and metaphysicians occasionally borrowed a stray fact from the abundant cases compiled by the medical authorities; but the physician on the other hand had no theoretical clew to his observations beyond a smattering of dogmatic psychology learned at college. To effect a reconciliation between the Psychology and the Pathology of the mind, or rather to construct a basis for both in a common science, is the aim of Dr. Maudsley's book."—*London Sat. Rev.*, May 25, 1864.

"The first chapter is devoted to the consideration of the causes of insanity. It would be well, we think, if this chapter were published in a separate form and scattered broadcast throughout the land. It is so full of sensible reflections and sound truths, that their wide dissemination could not but be of benefit to all thinking persons. In taking leave of Dr. Maudsley's volume, we desire again to express our gratification with the result of his labors, and to express the hope that he has not yet ceased his studies in the important field which he has selected. Our thanks are also due to the American publishers for the very handsome manner in which they have reprinted a work which is certain to do credit to a house already noted for its valuable publications."—*Quar. Journal of Psychological Medicine and Medical Jurisprudence*.

"Then follow chapters on the diagnosis, prognosis, and treatment of insanity, each characterized by the same bold and brilliant thought, the same charming style of composition, and the same sterling sense that we have found all through. We lay down the book with admiration, and we commend it most earnestly to our readers, as a work of extraordinary merit and originality—one of those productions that are evolved only occasionally in the lapse of years, and that serve to mark actual and very decided advances in knowledge and science."—*N. Y. Medical Journal*, January, 1863.

"This work of Dr. Maudsley's is unquestionably one of the ablest and most important, on the subjects of which it treats, that has ever appeared, and does infinite credit to his philosophical acumen and accurate observation. No one has more successfully exhibited the discordant results of metaphysical, physiological, and pathological studies of the mind, or demonstrated more satisfactorily the uselessness of an exclusive method, or the pressing need of combined action, and of a more philosophical mode of proceeding."—*Medical Record*, Nov. 15, 1867.

"In the recital of the causes of insanity, as found in peculiarities of civilization, of religion, sex, condition, and particularly in the engrossing pursuit of wealth, this calm scientific work has the solemnity of a hundred sermons; and after going down into this exploration of the mysteries of our being, we shall come up into active life again chastened, thoughtful, and feeling, perhaps, as we never felt before, how fearfully and wonderfully we are made."—*Evening Gazette*.

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